WHAT IS CLAIMED IS:

1. An optical receiver module comprising:

a photodiode chip, wherein a PIN photodiode is formed on a front side of the photodiode chip and electrical contacts to the PIN photodiode are formed on a backside of the photodiode chip; and

a transimpedance amplifier chip with electrical terminals coupled to the backside of the photodiode chip by solder bumps to form a chip-on-chip module.

2. The apparatus of Claim 1, wherein the PIN photodiode is fabricated using InP, and an InGaAs layer is formed on a P+ layer for making an ohmic contact.

3. The apparatus of Claim 1, wherein vias couple the electrical contacts on the backside of the photodiode chip to a cathode and an anode on the front side of the photodiode chip.

4. An apparatus comprising:

an optoelectronic device formed on a front side of an optoelectronic chip; and

at least one electrical contact on a backside of the optoelectronic chip, wherein the electrical contact is electrically coupled to the optoelectronic device through a substrate of the optoelectronic chip.

5. The apparatus of Claim 4, wherein the optoelectronic chip interfaces an optical system with an electrical system, and the front side of the optoelectronic chip is proximal to the optical system.

6. The apparatus of Claim 4, wherein the optoelectronic device has an aperture for communication with an optical system, and the aperture is proximal to the optical system.

7. The apparatus of Claim 5, wherein the backside of the optoelectronic chip is proximal to the electrical system.

8. The apparatus of Claim 4, further comprising a chip carrier, and wherein the backside of the optoelectronic chip is mounted on the chip carrier to assemble a chip package.

9. The apparatus of Claim 4, further comprising an electronic chip, and wherein the backside of the optoelectronic chip is mounted on the electronic chip to assemble a chip-on-chip module.

10. The apparatus of Claim 8, wherein the electrical contact on the backside of the optoelectronic chip is electrically connected to an electrical contact on the chip carrier using a solder bump.

11. The apparatus of Claim 9, wherein the electrical contact on the back side of the optoelectronic chip is electrically connected to an electrical contact on the electronic chip using a solder bump.

12. An apparatus comprising:

an array of optoelectronic devices on a front side of a chip; and

a corresponding array of electrical contacts on a backside of the chip, wherein the electrical contacts are electrically coupled to the corresponding optoelectronic devices by respective vias through a substrate of the chip.

13. The apparatus of Claim 12, wherein the optoelectronic devices are photo detectors.

14. The apparatus of Claim 12, wherein the optoelectronic devices are light emitting devices.

15. An apparatus for sensing a light signal and for producing a corresponding electrical signal, the apparatus comprising:

a photodiode formed on a front side of a semiconductor chip;

a first contact on a back side of the semiconductor chip, wherein the first contact is electrically coupled to an anode of the photodiode by a first via through a substrate of the semiconductor chip; and

a second contact on the back side of the semiconductor chip, wherein the second contact is electrically coupled to a cathode of the photodiode by a second via through the substrate of the semiconductor chip.

16. The apparatus of Claim 15, wherein the semiconductor chip is fabricated in a Si, Ge, GaAs, or InP semiconductor system.

17. The apparatus of Claim 15, wherein the photodiode is a PIN photodiode, an avalanche photodiode, or a metal-semiconductor-metal Schottky photodiode.

18. The apparatus of Claim 15, wherein the photodiode is used in an optical communication system to interface a fiber optic cable with an electronic receiver circuit, the front side of the semiconductor chip is proximal to an output of the fiber optic cable for receiving the light signal, and the backside of the semiconductor chip is proximal to an input of the electronic receiver circuit for providing the corresponding electrical signal.

19. The apparatus of Claim 15, further comprising a chip carrier, and wherein the first contact and the second contact are electrically bumped to corresponding contacts on the chip carrier.

20. The apparatus of Claim 15, further comprising an electronic receiver chip, wherein the backside of the semiconductor chip is coupled to a front side of the electronic receiver chip to form a chip-on-chip stack, and wherein the photo detector is exposed on top of the chip-on-chip stack for receiving the light signal.

21. The apparatus of Claim 20, wherein the first contact and the second contact on the backside of the semiconductor chip are electrically bumped to corresponding contacts on the front side of the electronic receiver chip.

22. The apparatus of Claim 20, wherein the electronic receiver chip is a transimpedance amplifier, and the anode and the cathode of the photodiode are coupled to respective inputs of the transimpedance amplifier by bumping the backside of the semiconductor chip to the front side of the electronic receiver chip.

23. An apparatus for receiving an electrical signal and for producing a corresponding light signal, the apparatus comprising:

a laser diode formed on a front side of a chip substrate; and

contacts formed on a backside of the chip substrate, wherein the contacts are electrically coupled to the laser diode by electrically conductive via holes through the chip substrate.

24. The apparatus of Claim 23, wherein the laser diode is a distributed-feedback laser or a vertical surface emitting laser.

25. A method of fabricating a front side illuminated photodiode with backside bump, the method comprising:

forming the photodiode on a front side of a semi-insulated substrate;

forming first contacts on the front side, wherein the first contacts are respectively electrically coupled to a cathode and an anode of the photodiode;

forming electrically conductive via holes through the semi-insulated substrate; and

forming second contacts on a backside of the semi-insulated substrate, wherein the second contacts are electrically coupled to the first contacts by the respective via holes.

26. The method of Claim 25, wherein the photodiode is a PIN photodiode and is formed by the following steps:

growing epitaxially N+, intrinsic, and P+ layers on the front side of the semi-insulated substrate;

applying one or more masks to form a desired structure for the PIN diode; and

depositing silicon nitride to exposed surfaces to reduce light reflection.